

## 4.8. LIQUID MATERIAL MANAGEMENT

### Management Measure for Liquid Material Management:

***Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials.***

### ***Management Measure Description***

Marinas store a variety of liquid materials for boat and facility operation and generate a variety of liquid wastes through the activities that occur on marina property. Adequate storage and disposal facilities are important if these materials are to be kept out of the environment. Proper storage is also important to ensure that liquid materials do not become contaminated while in storage and have to be prematurely disposed of. Marina patrons and employees are more likely to properly dispose of liquid wastes if adequate and safe disposal facilities are provided. Many states have mandatory or voluntary programs that address this management measure.

Proper storage and disposal of potentially harmful liquid materials can eliminate their entering marina waters and harming the aquatic environment, aquatic organisms, and marina or customer property. Liquid materials for sale or use at the marina, such as fuels, oils, solvents, and paints, should be stored in a manner that minimizes the chance of a spill and contains a spill should one occur. Liquid wastes, such as waste fuel, used oil, spent solvents, and spent antifreeze, should be similarly stored until they can be recycled or disposed of properly.

Small quantities of many liquid wastes, including antifreeze, waste oil, pesticides, cleaners, solvents, and paints, can be harmful or deadly to people, wildlife, pets, fish, and other aquatic organisms. Discharge of these materials into

marina waters is not only environmentally damaging, but also destroys the overall clean, healthy environment that a marina can provide to its patrons. Dirty marinas affect boater satisfaction and present a poor image to prospective patrons. A clean marina reinforces the public image that boating is clean and that marinas are beneficial for the environment.

Regulations also play a role in proper liquid material and waste management. Approved spill protection materials and methods might be required by the local fire department and are necessary for marine environmental and liability insurance coverage. Regardless of whether a liquid waste material is eventually recycled or disposed of, careful documentation of how much material is collected, how it is removed from the facility, and where it is ultimately going is extremely important. These records are invaluable if there is ever any question from state or federal authorities about the marina's hazardous waste collection and disposal practices.

Marina staff and boaters should be informed about safe storage and disposal of liquid wastes. If a marina collects waste oil for recycling or disposal, precautions need to be taken to prevent contamination of one waste type with an incompatible type. Contaminated or mixed liquid wastes are very expensive to dispose of because commercial removal companies charge their highest rates for unknown mixtures. Some marinas have received costly fines by not controlling what is dumped into waste oil

containers, or who dumps materials into them. Holding tanks for liquid wastes should be kept locked, and a staff person should be responsible for moving waste from a collection site to the storage facility.

## ***Best Management Practices***

### **Pollution Prevention Practices**

- *Build curbs, berms, or other barriers around areas used for liquid material storage to contain spills.*

To contain spills, curbs or berms should be installed around areas where liquid material is stored. A general guide is to build berms or curbs to be capable of containing 10 percent of the total volume of liquid material stored or 110 percent of the volume of the largest container in storage, whichever is greater. Drains in the floor would defeat the purpose of the curbs or berms, so any drains present should be permanently closed.

- *Store liquid materials under cover on a surface that is impervious to the type of material stored.*

Containers of hazardous liquid materials are best stored in a protected place where rain will not lead to the containers' rusting and rupturing. It is equally important that the surface on which the containers are stored and of which the berms or curbs are made be impervious to the contents of the containers. If they aren't, a spill could quickly destroy the spill containment material and spread.

- *Storage and disposal areas for liquid materials should be located in or near repair and maintenance areas, undercover, protected from runoff with berms or secondary containment, and away from flood areas and fire hazards.*

Elliot Bay Marina (Washington) has its staff pick up almost any hazardous waste directly from the boat owner. This saves the potential high cost for disposing of hazardous materials that have been accidentally mixed by customers, thrown into dumpsters, or left on the dock where they could fall or leak into the water. This practice has worked well and has resulted in lower disposal costs, a spill-free marina, and happier customers who do not have to handle the waste product (EPA, 1996: *Clean Marinas—Clear Value*).

- *Store minimal quantities of hazardous materials.*

A good idea is to conduct a regular review of the facility's hazardous materials inventory to identify any materials that can be stored in smaller amounts, or that are no longer needed or that have expired on the shelf. Buying only as much material as will be used within a year, or on a project basis, can save money and reduce waste.

- *Provide clearly labeled, separate containers for the disposal of waste oils, fuels, and other liquid wastes.*

Waste oils include waste engine oil, transmission fluid, hydraulic fluid, and gear oil. Waste fuels include gasoline, diesel, gasolines/oil blends, and water contaminated by these fuels. Other liquid materials of concern include used antifreeze/coolant, solvents, acetone, paints, and, if a restaurant is present, edible cooking oils and fats. Each of these liquids needs a separate container that is clearly marked to prevent mixing with other liquids and to assist in its identification for proper disposal. The containers should be covered in a manner that prevents rainwater from entering them. Used oil filters are best drained before disposal by placing the filter in a funnel

Deep River Marina (Connecticut), Conanicut Marine Services (Rhode Island), and many other marinas use portable oil-changing units that use a vacuum tank to suction oil out of an engine through the dip-stick tube. The unit is rented to boaters for do-it-yourself oil changing (EPA, 1996: *Clean Marinas—Clear Value*).

## SECTION 4: Management Measures

---

over the appropriate waste collection container. Waste should be removed from the marina site by someone permitted to handle such waste, such as a hazardous material contractor, and receipts and records of all materials disposed of and hauled away should be retained for inspection.

Paint cans with unused paint should be opened in well ventilated areas and left to dry until solid, then disposed of with normal trash. For information on how to handle particular types of hazardous wastes and which wastes are hazardous and which are not, contact a local extension service, waste hauler, or fire department.

- *Recycle liquid materials where possible.*

The decision to recycle is usually based on the type of waste and the availability of recycling facilities. Where a recycling program is available, consider participating and encouraging the participation of all marina patrons.

- *Change engine oil using nonspill vacuum-type systems for spill-proof oil changes, or to suction oily water from bilges.*
- *Use antifreeze and coolants that are less toxic to the environment.*

Care should be taken to avoid combining different types of antifreeze/coolants. Propylene-glycol-based antifreeze (with a PINK color) *should be used* because it is less toxic to the environment. Ethylene-glycol-based antifreeze (identifiable by its BLUE-GREEN color) is very toxic to animals and should be recycled when it is used.

- *Use alternative liquid materials where practical.*

When possible, use low-toxicity or nontoxic materials, such as water-based paints and solvents and propylene-glycol antifreeze, in place of more toxic products. The use of nontoxic, high-bonding, easily cleaned coatings can be encouraged among marina patrons. Solvents with low volatility and coatings with low volatile

organic compound (VOC) content are available, as are long-lasting and nontoxic antifouling paints.

- *Follow manufacturer's directions and use nontoxic or low-toxicity pesticides.*

At both marinas and boat launch sites, all pesticides (herbicide or insecticide) should be applied according to the directions provided on the container, and should be applied by someone trained in pesticides application. All precautions should be taken to avoid allowing any pesticide to enter surface waters. Herbicides that are not toxic to aquatic life are safest to use. A local extension service is a good source of information on the relative safety of pesticides and where and when they can be safely applied. Use of mulches in gardens and under shrubs can be as effective a method for controlling weeds and is more environmentally friendly than herbicides.

- *Burn used oil used as a heating fuel.*

EPA permits burning used oil as a heating fuel (though some states might not permit it) if special high-temperature furnaces are used. This eliminates disposing of the used oil as a hazardous waste (Figure 4.14). Normally, the only oil that can be used as a fuel for high-temperature furnaces is that collected as part of normal maintenance and boat service work, but check with the local environmental authority or the furnace manufacturer.

### Source Reduction Practices

- *Prepare a hazardous materials spill recovery plan and update it as necessary.*

If large amounts of hazardous materials and/or wastes are stored even for short periods of time on marina property, a spill prevention and recovery plan should be adopted. The plan should list the types and volumes of materials that could potentially be spilled. This information is important because spill response action is dependent on the type of material spilled. A spill



Figure 4.14. West Access Marina (Illinois) installed a high-temperature furnace in 1993, which extended the marina's boat maintenance activities into and through the winter. The marina's engine maintenance service collects between 1,000 and 2,000 gallons of waste oil a year. It is collected in small containers and stored in a 1,000-gallon drum. The furnace burns very cleanly at 3,000 °F. The furnace saves the marina thousands of dollars each year in waste oil removal costs (EPA, 1996: *Clean Marinas—Clear Value*).

Equipment that is suitable for the variety of materials stored and can contain spilled material and prevent it from entering surface waters should be readily available near where spills are likely. Many hazardous materials do not remain on the water surface if they do enter surface waters, so absorbent materials should be used as soon as possible after a spill to contain them. These materials should then be disposed of properly.

BMP Summary Table 8 summarizes the BMPs for Liquid Material management mentioned in this guidance.

response plan for hazardous material can be integrated into an oil spill response plan and should include the same components:

- *Who:* Clearly identify who is responsible for taking what action.
- *What:* Explain what action should be taken during a spill event and, based on multiple scenarios, what equipment should be deployed.
- *When:* Specify when additional resources should be called for assistance.
- *Where:* Tell where the material is located in the facility.
- *How:* Explain how the equipment should be used and disposed of.
- *Keep adequate spill response equipment where liquid materials are stored.*

**BMP Summary Table 8. LIQUID MATERIAL MANAGEMENT**

**MANAGEMENT MEASURE - Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid material, such as oil, harmful solvents, antifreeze, and paints, and encourage recycling of these materials.**

**ENVIRONMENTAL CONCERNS:**

Liquid material such as fuels, oils, solvents, paints, pesticides, acetone, cleaners and antifreeze are potentially harmful or deadly to wildlife, pets, and humans, and are toxic to fish and other aquatic organisms when they enter a waterbody. This is true for other types of liquid wastes such as waste fuel, used oil, spent solvents, battery acid, and used antifreeze. Waste oils include waste engine oil, transmission fluid, hydraulic fluid, and gear oil. Waste fuels include gasoline, diesel, gasoline/oil blends, and water contaminated by these fuels.

Best Management Practice Examples & Type	Marina Location & Usage	Benefits to Marina	Projected Environmental Benefits	Initial Cost Estimate	Annual Operation & Maintenance Cost Estimate	Notes
<b>POLLUTION PREVENTION PRACTICES</b>						
Build curbs, berms, or other secondary containment barriers around areas used for liquid materials storage to contain spills	Designated work area - universally recommended	MODERATE; reduces loss of spilled liquids; containment makes for easy less expensive clean up	HIGH; provides extra protection by ensuring that if spills or leaks do occur, the hazardous liquids will be contained and not enter the water	MODERATE to EXPENSIVE	LOW	Berms or curbs should be capable of containing 10% of the total volume of liquid material stored, or 110% of the volume of the largest container in storage, whichever is greater; make sure there are no drains in the floor.
Store liquid materials under cover on a surface that is impervious to the type of material stored	Designated work area - universally recommended	HIGH; properly protected containers should not rust or rupture; saves on clean up costs	HIGH; impervious surface protects against the spreading of harmful liquids into the ground if a spill does occur	LOW to MODERATE	LOW	Liquid material containers must be properly and clearly marked.
Storage and disposal areas for liquid materials should be located in or near repair and maintenance areas, undercover, protected from runoff with berms or secondary containment, and away from flood areas and fire hazards	Designated work area - universally recommended	MODERATE; more convenient to have the liquids storage area located near repair and maintenance	MODERATE; keeping storage area away from flood zones and fire hazards reduces risk of spills, leaching or explosion	MODERATE to HIGH	LOW to MODERATE	Liquid material and waste storage area must be properly and clearly marked.

**BMP Summary Table 8. (cont.) LIQUID MATERIAL MANAGEMENT**

<b>Best Management Practice Examples &amp; Type</b>	<b>Marina Location &amp; Usage</b>	<b>Benefits to Marina</b>	<b>Projected Environmental Benefits</b>	<b>Initial Cost Estimate</b>	<b>Annual Operation &amp; Maintenance Cost Estimate</b>	<b>Notes</b>
Store minimal quantities of hazardous materials	Designated work area - universally recommended	MODERATE; reduces inventory and spill potential	MODERATE; reduces potential for environmental damage due to leaks, spills, or explosions	LOW	LOW	Use records of past jobs to estimate volume of liquids needed to keep in storage.
Provide clearly labeled, separate containers for the disposal of waste oils, fuels, and other liquid wastes	Designated work area - universally recommended	HIGH; expensive for waste haulers to remove an unknown mixture of substances, cheaper if substances are known	HIGH; ensures that each type of waste will be properly handled and disposed of	MODERATE	LOW to MODERATE	Requires clear signs indicating proper contents and use.
Recycle liquid materials where possible	Designated work area - universally recommended	MODERATE to HIGH; in some locations recycling is cheaper than disposal	MODERATE; benefits beyond the marina	LOW	LOW to MODERATE	The decision to recycle is generally based on the type of waste and availability of recycling facilities.
Change engine oil using nonspill vacuum-type systems for spill-proof oil changes, or to suction oily water from bilges	Marina docks and dry work areas – generally recommended	MODERATE; can be a profit source for marinas; easy to use off-the-shelf equipment	HIGH; spill-proof container keeps oil out of water; easy to carry to recycling container	LOW	LOW	System available from marine distributors.
Use antifreeze and coolants that are less toxic to the environment	Designated work areas - universally recommended	MODERATE; lower toxicity products protect the marina property and customer health	MODERATE; less toxic propylene-glycol based antifreeze (with PINK color) is much less toxic to animals	None	LOW	Care should be taken not to mix different types of antifreeze/coolants; both need separate clearly labeled containers.

**BMP Summary Table 8. (cont.) LIQUID MATERIAL MANAGEMENT**

<b>Best Management Practice Examples &amp; Type</b>	<b>Marina Location &amp; Usage</b>	<b>Benefits to Marina</b>	<b>Projected Environmental Benefits</b>	<b>Initial Cost Estimate</b>	<b>Annual Operation &amp; Maintenance Cost Estimate</b>	<b>Notes</b>
Use alternative liquid materials where practical	Designated work areas - universally recommended	MODERATE; less toxicity to environment and human health, generally work just as well as more toxic products	MODERATE; reduces use of toxic substances and possibility that toxins will enter the water	LOW	LOW	Liquids such as water-based paints, propylene-glycol antifreeze, solvents with low volatility, and coatings with low volatile organic compounds, and longer-lasting or non-toxic antifouling paints can be used and promoted .
Follow manufacturer's directions and use non-toxic or low toxicity pesticides	Designated work areas - universally recommended	MODERATE; reduces risk to human health, pets, children	MODERATE; reduces toxicity to aquatic life	LOW	LOW	Cooperative Extension Service can provide information on pesticide safety and use.
Burn used oil as a heating fuel	Designated work areas - universally recommended	HIGH; cost-saving measure, as it eliminates cost of waste oil removal and extends maintenance activities through the winter	HIGH; any reuse of oil reduces the use of fossil fuels	MODERATE	LOW	Allowed by EPA in special high-temperature furnaces.

<b>BMP Summary Table 8. (cont.) LIQUID MATERIAL MANAGEMENT</b>						
<b>Best Management Practice Examples &amp; Type</b>	<b>Marina Location &amp; Usage</b>	<b>Benefits to Marina</b>	<b>Projected Environmental Benefits</b>	<b>Initial Cost Estimate</b>	<b>Annual Operation &amp; Maintenance Cost Estimate</b>	<b>Notes</b>
<b>SOURCE REDUCTION PRACTICES</b>						
Prepare a hazardous materials spill recovery plan and update it as necessary	Designated work areas - universally recommended	MODERATE; ensures more efficient clean up in the event of a spill; helps reduce liability exposure	MODERATE; planning and training will reduce chance and volumes of spills	LOW	LOW	May be integrated into an oil spill response plan and should include the same components.
Keep adequate spill response equipment where liquid materials are stored	Designated work areas - universally recommended	MODERATE; having equipment available will control spills faster; helps reduce liability exposure	MODERATE; equipment must be suitable for the variety of materials stored	LOW to MODERATE	LOW to MODERATE	Many hazardous materials do not remain on the water, so absorbent materials should be used to contain them.